Questions Submitted Concerning the

Draft SMEX AO

Draft Released for Community Comment 12 August 2002
"Modifications to the Draft SMEX AO" Released 4 December 2002

Questions last updated 9 January 2003

Q1 Is there a timetable for updating the SMEX ELV Services Information Summary? Will there be some updated pricing information available while the draft SMEX AO is out for comment?

A draft *SMEX Expendable Launch Vehicle Services Information Summary* document is now available in the Draft SMEX Explorer Program Library (http://explorer.larc.nasa.gov/explorer/sel.html).

Q2 I'm writing to remind you of our discussion last summer regarding the possibility of accepting Mission of Opportunity proposals to use an existing NASA mission, after it has completed its approved science investigations, in order to conduct science investigations which are unrelated to the science investigations for which the mission was approved and developed. I would very much appreciate it if you could modify the AO as you indicated last year.

I will try to revise the SMEX AO so that the Mission of Opportunity category includes the use of an existing NASA asset for a new science mission.

Revision December 3, 2002: The SMEX AO will be revised to allow proposals of this type. See "Modifications to the Draft SMEX AO" on this web site.

Q3 Section 3.4.5 (page 9) International Space Station Requirements. "To learn of any significant change to these policies or milestones….contact the point of contact in the International Space Station Research Opportunities document…" There is no document by this name on that web site. The one with the closest title refers to Missions of Opportunity and the document is dated 1999. Section 4.2.2 (Page 18) also refers to this document. (We note that that document in the SMEX library is flagged as needing to be updated).

This is the appropriate document. It will be revised; please read the final document carefully when it is available. However, unless something changes (which might happen for ISS payloads), the rules for MO's and SMEX's are identical for full truss attached payloads; the only difference is the cost cap.

Q4 Section 3.6.3 (page 12) NASA OSS Cost. "Examples of costs to be included are launch services including any upper stages; ..." Nothing in this draft AO indicates whether proposals for SMEX instruments on ISS full truss sites must include any of the costs of Shuttle launch to the ISS and Shuttle recovery from the ISS. If Shuttle costs are not to be counted against the cost cap, then the AO should state that fact. If Shuttle costs are to be counted against the cost cap, then the AO should give guidelines for that costing (or should refer to a document in the Explorer Library that gives such guidelines).

In this draft of the SMEX AO, there is no charge for Shuttle launch of science payloads to the ISS nor for return of science payloads to Earth. This policy is currently under discussion within NASA and may change. We will state the policy explicitly in the final AO. Please read the final SMEX AO carefully when it is released.

Revised December 3, 2002: Costs for use of the Shuttle to transport ISS payloads, including transportation costs, standard services, and special services, must be included in the NASA OSS Cost cap. See "Modifications to the Draft SMEX AO" on this web site.

Q5 Section 4.2.2 (page 18) says, "The PI is responsible for working manifest, safety, and other issues with the point of contact(s) identified in the "International Space Station Research Opportunities" document in the Explorer Program Library." Does this sentence mean that manifest etc issues are to be worked by the PI prior to submitting the proposal in response to this AO? Or does it just mean that the PI must work these issues during the program (after selection)?

We will clarify the language. At the moment, the intent of the AO is that the proposal should be as responsive as possible to these issues at time of proposal. For safety and mission uniques, that means dealing with them in your technical and cost proposal like any other implementation issue at the pre-phase A stage (e.g., same level of detail as for a ELV). For manifest, the POC will have the latest information on the manifest constraints for the ISS opportunity that you are proposing to (e.g. full truss attached). It is our intent to only offer ISS opportunities that can be manifested if selected, and we do not intend that the potential PI must identify the exact launch opportunity prior to selection. The ISS assembly schedule and the policy for ISS science payloads are currently under discussion within NASA and may change. Please read the final SMEX AO carefully when it is released.

Q6 Section 4.4.1 (page 19) requires that SMEX instruments for the ISS full truss site must be ready for launch by February 2007, even though other SMEX proposals can be for launch by either February 2007 or February 2008. Why the more limiting requirement for ISS instruments than for free-flyers? This statement seems to contradict the previous sentence that says ISS payloads are exempted from the launch date requirement.

You caught an inconsistency in the draft SMEX AO that we are aware of. At the time the draft AO was released, it was not clear whether there would be an earlier launch constraint for the full truss attach site then for the rest of this SMEX opportunity. There may very well be such a constraint as it is possible that a full truss attach payload will be flown instead of a zenith EXPRESS palette, hence the full truss payload would be constrained to launch when the payload is manifested. This constraint will be resolved and clarified in the final AO. The ISS assembly schedule is currently under discussion within NASA and may change. Please read the final SMEX AO carefully when it is released.

Q7 Sections 5.4 (page 23) and 4.2.2 (page 18) seem to be in conflict. Section 5.4 says that a zenith EXPRESS Pallet on the ISS is planned beginning in 2007, while Section 4.2.2 solicits full-truss instruments. If there is to be a zenith EXPRESS Pallet starting in 2007 (or even 2008), it will occupy one of the two zenith full-truss sites. Meanwhile the most recent ISS schedule shows AMS occupying the other zenith full-truss site for three years from about early 2006. Can we assume that an appropriate site will be available for a full-truss payload?

It is our intent at this time that a full-truss payload will replace the zenith EXPRESS palette scheduled for 2007. This situation requires that, if NASA selects a ISS attached payload, NASA can select either a full truss payload or a zenith EXPRESS palette payload, but not both. Please read the final SMEX AO carefully when it is released.

Q8 I'm also a little fuzzy about the duration of the cash flow, if one goes for a series of LDB flights under MOO. The first flight needs to take place by February 2008, but there appears no limit on how many flights and the duration of the series, so long as the money holds out. Is this correct?

That is correct: there is no limit on how many flights as long as the first one takes place before February 2008, the money holds out, and the flights are justified scientifically in the proposal. The required number of flights proposed will be evaluated during the peer review.

This is spelled out in Section 5.3: "A complete mission using LDB's may include more than one flight as long as the first flight is no later than February 2008 and the total investigation is executed within the Mission of Opportunity cost cap."

Q9 There appears to be a little bit of confusion about the selection criteria. The criteria in the last paragraph of 7.2.1 and the 1st paragraph of 7.3 are slightly different (basically whether cost counts on an equal basis with science and implementation). 7.2.1 is discussing categorization (I, II, III, IV) and 7.3 is selection. But most people equate one with the other. The two paragraphs are not inconsistent, but it is somewhat confusing as to how much weight is given to the overall cost.

Although some people may equate categorization with selection, they are distinct steps in the process of evaluating and selecting a SMEX mission (or, for that matter, selecting any proposal in response to a NASA AO).

Categorization is based on an evaluation of the proposal for scientific, technical, and concept (i.e. feasibility of implementation as proposed) merit. For Explorer, we conduct all of these evaluations through peer reviews including concept. Although cost realism is evaluated (can you do it for the proposed cost?), cost itself is not evaluated (is the mission proposed to be expensive or cheap?). The proposed cost of your mission is not evaluated by the TMC peer review. It is therefore not a criterion for categorization.

Note that at the end of categorization, there are a number of Category 1 proposals eligible for selection. For the Explorer and Discovery programs, approximately 15-25% of the proposals are usually Category 1 (but there is no quota, these are historical averages). The Category 1 proposals are not ranked during categorization.

However, at selection, the selecting official may take into account many factors in addition to the evaluation of the proposals. Of course only proposals which received extremely positive evaluations (i.e. Category 1 proposals) are even eligible for consideration for selection. In addition to the evaluations, the selecting official may also consider the proposed cost. If two proposals both propose excellent science and a feasible implementation plan, then the selecting official may decide to choose one because it is less expensive. This supports our overall goal of maximizing the science return within the Explorer budget constraints.

Regarding how much weight is given to cost: no weight is given to cost for categorization (Section 7.2.1), cost is weighted equally with the other three criteria for selection (Section 7.3; you do the math).

Q10 The Draft AO for SMEX says that the deadline for proposals will be May xx, 2003. Can you tell me if it likely to be nearer the end or the beginning of the month?

The deadline will be 90 days after the release date. The exact date depends on the time taken for decision and approval processes for the final AO. The dates in the draft AO are the best dates available now. And they could change.

Q11 Launch vehicle costs have a large impact on mission designs. Any NASA guidance on launch vehicle costs that could be provided prior to the final release of the AO would be greatly appreciated.

Launch vehicle costs are posted in the SMEX Explorer Program Library at http://explorer.larc.nasa.gov/explorer/sel.html.

Q12 The new cost cap of $100M is an improvement, however, its value is negated by reducing the allowed contributions to one-third of the NASA OSS Cost.

The standard limit on contributions for Explorer and Discovery missions is one-third of the NASA OSS cost. This policy exists to ensure that an Explorer mission is a NASA OSS mission and not a joint mission. Since these missions are cost capped and subject to termination if the cap is breached (Sections 4.5 and 5.5), NASA wants to retain the ability to unilaterally terminate the project. The 100% contribution cap for the 1999 SMEX AO was an exception to this rule.

Q13 In case of a conflict between the AO and documents specified in Appendix C or in the SMEX Program Library, which takes precedence?

The AO always takes precedence. We will clarify this in the final AO.

Q14 The instructions in Appendix B do not include any reference to Phase F activities, excluding the cost tables B3-B5. Where are the Phase F activities to be discussed within the proposal?

Phase F activities should be discussed wherever they make sense; this will depend upon the nature of the proposed science enhancements. Phase F activities will be evaluated according to the criteria in Section 7.2.3.

Q15 If a proposal doesn't include a Phase F activity, will it be penalized or judged differently from those proposals that include Phase F enhancements?

A proposal that does not include a Phase F activity will not be penalized. Proposals that include Phase F activities will have those activities evaluated as described in Section 7.2.3; proposals that do not include Phase F activities will not be evaluated against the Phase F criterion.

Q16 In reference to Section 3.4.2, is cost/risk a factor to be included in the evaluation of using services other than SCDS? The AO seems to steer Proposers toward using SCDS services without considering cost/risk benefit.

All aspects of the proposal are evaluated for risk, including cost risk (see evaluation criteria in Section 7.2.4). Regarding SCDS, Section 3.4.2 states, “Proposers are free to propose use of services from sources other than the NASA Space Communication and Data Systems (SCDS).” Since NASA has already competed the provision of certain mission and data services, and has contracts with selected provider(s), a determination must be made as to whether the existing contracts will be used. This determination may be made as late as Phase B (Section 3.4.2).

Q17 Is there a NASA funding profile, and if so, what is it?

There is no NASA funding profile for Explorer proposals, only a cost cap. Note that, if a selected mission has a proposed funding profile that cannot be accommodated by the Explorer program available funding, then an acceptable funding profile will have to be negotiated after selection. This is more likely for the mission selected to launch second (Section 7.4.4).

Q18 What is NASA's definition of a minimum "science component", as used in the third sentence of Paragraph 1 in Section 4.6?

The “science component” is those aspects of the mission that contributes to the accomplishment of science objectives.

Q19 What is the requirement for page margins for the proposal text?

No requirement is specified in the Draft AO. Please check the final AO carefully for any requirement on page margins. If no requirement is specified, proposers should keep in mind that legibility enables accurate evaluations.

Q20 In Section 7.4.2, what is meant by "each contract will also contain a cost option for Phase B/C/D and E activities" Is this part of the fixed price contract for Phase A?

Each Phase A contract will contain an option for the remainder of the mission development and implementation. Upon downselection, it is NASA’s intent to exercise the option for any mission selected to proceed into Phase B, and to not exercise the option for any mission not selected to enter into Phase B.

Q21 In Section 7.4.5, "Confirmation Investigation," does the 20% cost reserve against the cost to complete exclude ELV and MO&DA costs, as identified in Section 4.5?

Yes.

Q22 Does a foldout page with printing on both sides constitute one or two pages?

Two. See Appendix B, "Every side upon which printing appears will be counted against the page limits."

Q23 Appendix B, Section D, Paragraph 1, what is the definition of scientific products and science products in relation to data product? Does the science product include analysis of data?

Science products include data and anything else that contributes to the science output of the mission. This can include, but is not limited to, ancillary or calibration data, theoretical calculations, higher order analytical or data products, sample returns, witness samples, laboratory data, etc. The result of data analysis is a science product.

Q24 In Appendix B, Section E, should the product assurance discussion also include mission assurance activities, or are these interpreted as one in the same?

The proposal must discuss mission assurance activities, and these activities must be consistent with the SMEX mission assurance document (Sections 3.2 and 3.4.1).

Q25 If the cost tables and the Master Equipment List, WBS and WBS Dictionary are not counted against the page count, are these pages to be numbered and where are they to be placed?

All pages should be numbered. These pages should be placed wherever they make sense.

Q26 Page B-17; what does "MA" within PM/MA/SE stand for; Mission Analysis or Mission Assurance?

"Mission Analysis." See footnote 2.

Q27 Are guidelines available for estimating the cost of software IV&V?

No.

Revised December 3, 2002: If the IV&V self-assessment indicates some level of IV&V will be needed, it is recommended that proposals to this AO include 15% of their software costs for IV&V activities. See "Modifications to the Draft SMEX AO" on this web site.

Q28 What guidance can NASA offer to proposers of Mission of Opportunity experiments and international collaborations when a statement is made indicating "NASA is not obligated to select a Mission of Opportunity under this solicitation"? (Section 1.0 -Description of Opportunity).

None whatsoever. Section 1.1 accurately describes the situation. NASA may, or may not, select a Mission of Opportunity proposal. The decision will be made based on the evaluation criteria in the Draft AO (which depend on the quality of the proposal) as well as programmatic considerations including cost (Section 7.3). Missions of Opportunity may be selected "when the perceived value is high and the proposed cost to NASA OSS is within the funding limits of the Explorer program" (Section 1.1). NASA is willing to consider such proposals, but makes no commitment to select one.

Q29 Under Section 1.3 -Proposal Opportunity Period and Schedule, the elapsed time between the award date for Phase A, and the Phase A Concept Study Report is approximately 5 months. It was suggested by the users' community in the Explorer Workshop sponsored by NASA-HQ – March 12, 2002, that this period be extended to six (6) months from the time funds become available, providing a better chance of competition among the down-selected programs. Will this suggestion be considered at this time?

As a result of the suggestions made by the users' community at the Explorer Workshop, the elapsed time described was increased from 4 months (as in the last MIDEX AO) to 5 months. There is typically a month between notification of selection for Phase A and initiation of Phase A funding, thus the time from notification to concept study report due date is 6 months.

Q30 Do the proposed Baseline and the Minimum Mission requirements apply to Missions of Opportunity experiments? (4.6 Baseline and Minimum Missions)

No. Section 4 (including Section 4.6) applies only to Explorer missions. The requirements for Missions of Opportunity are given in Section 5. A Mission of Opportunity is only required to propose a baseline mission (though there is no prohibition to proposing a minimum mission if the proposer believes that this makes sense).

Q31 Under what conditions could a Mission of Opportunity be selected without first completing a Phase A concept study? (5.1 Missions of Opportunity Background and Constraints)

It is up to the Mission of Opportunity proposer to identify conditions that require selection prior to the completion of a Phase A study. NASA may or may not find these conditions sufficient.

Q32 In the Explorer Workshop sponsored by NASA-HQ – March 12, 2002, it was indicated that the cost of writing a successful proposal to earlier SMEX/MIDEX/MO AOs was estimated to be about $250K. Why is NASA funding for a selected MO Phase A Concept Study limited to $250K (an amount which has been constant since at least 1997), which is equivalent to the proposal development effort when this phase is supposed to produce more mature results? (5.5 Cost and Schedule Requirements for Missions of Opportunity).

Missions of Opportunity are smaller efforts than SMEX missions (less than $35M vs. $100M). The lower Phase A funding reflects that fact.

Q33 It is an undue burden to the proposers to keep requesting full and complete proposals when NASA is only approving a Phase A Concept Study and has other reviews in place for selected missions. There was some community consensus expressed in the Explorer Workshop of March 12, 2002, to suggest dropping this requirement. Is there any chance that this can be implemented at this time?

The 1999 SMEX AO did not require full technical proposals. NASA surveyed the proposers following that solicitation. Based on both the response of the 1999 proposers and the results of the concept studies that resulted from that solicitation, NASA has decided that the Explorer program is better served by requiring full technical proposals. The NASA attendees at the Explorer Workshop do not agree with the questioner that there was community consensus to drop this requirement.

Please see the document "Report on the 1999 SMEX TMC-lite Solicitation" which is also posted on the SMEX Acquisition Additional Information web page at http://explorer.larc.nasa.gov/explorer/smexacq.html.

Q34 Reference Section 1.3: Is launch required by February 1, 2007 or February 27, 2007?

The Draft AO requires that launch must occur "no later than February 2008." This means no later than anytime in February 2008. Effectively the launch readiness date requirement is February 29, 2008. There is no requirement for launch by February 2007. NASA anticipates selecting a proposal that chooses to launch by February 2007, however this is not a proposal requirement.

Q35 Reference Section 4.5: Do 20% reserves need to be carried on E/PO and Science during Phase C/D?

The requirement is that, “at the investigation's Phase B/C Confirmation Review, the PI will be required to demonstrate a minimum cost reserve of 20%, or to justify a cost reserve of less than 20%, against the cost to complete (not including the launch vehicle or MO&DA)” (Section 4.5). So reserves do need to be carried on the cost to complete including E/PO and science during Phase C/D unless the proposer can justify not doing so.

Revised December 3, 2002: An increased importance will be placed on the adequacy of cost reserves to reduce cost risk. See “Modifications to the Draft SMEX AO” on this web site.

Q36 Reference Section 4.5: Do 20% reserves need to be carried on Phase A or Phase B costs?

Since the requirement is on cost to complete at the end of Phase B, this requirement cannot apply to Phases A and B. The proposal should identify the reserves posture and justification for Phase A/B.

Revised December 3, 2002: An increased importance will be placed on the adequacy of cost reserves to reduce cost risk. See “Modifications to the Draft SMEX AO” on this web site.

Q37 Reference Section 3.4.4: Do the available GSFC services apply during the proposal process or during the mission development?

The first paragraph of Section 3.4.4 describes services available during the “Stage 1 proposal” process. The second paragraph in Section 3.4.4 describes services available if GSFC is added to the study team for the Phase A downselect process. If GSFC is added to the proposal team for the Phase A concept study, then during mission development GSFC would perform any services that are described in the Phase A concept study report.

Q38 Reference Section A-2, Section VI: Is there a cost cap on the 2-month bridge phase?

No. The Bridge Phase is intended to cover a two-month period of Phase B effort. The proposal should justify the amount proposed for the Bridge Phase. It is important to note that, if the Phase A contract plus potential Bridge Phase exceeds $550K, then the contractor would have to certify his/her costs.

Q39 Section 3.4.5: What sort of significant changes to policies or milestones would “affect OSS’s ability to offer ISS opportunities”? What is the likelihood of this happening?

The agency is still wrestling with questions like the ISS schedule for putting science experiments on board, whether the 4 funded STS flights will be used for science payloads, the schedule for the international provided attach points (e.g. JEM-EF), etc. We made assumptions about the outcome of these policy deliberations in order to put out a draft AO. If those assumptions are incorrect, we will have to change or eliminate the ISS opportunities. Stay tuned.

Q40 Sections 3.6.2, 5.5: Section 3.2 outlines rules for contributions. Section 5.5 states that the limit for contributions for LDB, ISS, and data buys is 1/3 of NASA OSS cost. Is there a limit to the contributions allowed for other MoOs and full SMEX missions?

There is no limit for classic missions of opportunity since a classic mission of opportunity is itself a contribution to a non-OSS mission. We will evaluate each classic mission of opportunity proposal to determine if it makes sense. The contribution limit for full SMEX missions is 1/3 of NASA OSS cost (Section 4.4.3).

Q41 Table B3: Starts with FY1 (which stands for 1st fiscal year?), which is confusing. Replace with FY03, etc.

We expect the proposer to change that to the correct fiscal year, just as the proposer replaces row headings with appropriate labels. We are trying to standardize Appendix B so it does not have to be personalized for every AO.

Q42 At the bottom of page B-10, there are some "highly recommended" items that could be included in the cost plan (such as the Master Equipment List, a WBS, and a WBS dictionary), but which are claimed to <u>not</u> count against the page limit. This sends a bizarre message that somehow this information is <u>so</u> important that it won't count against the page limit, but is optional. Not very clear guidance, in my opinion. It appears that the costing genie got out of the box you tried to keep him in -- will he go back in the box, or are we going to dump full-blown WBS details on the reviewers?

A full-blown MEL or WBS is not expected at this stage. However, in all probability some preliminary top-level version of them was used to generate the budget in the proposal. Whatever was used would be of value to the reviewers in the same way it was of value to the proposers. The basic objective is not for more work to be done but for the proposers to reveal more of their costing tools to the reviewers. This is consistent with our previous (and current) instructions that proposers should "provide rationale that describes why NASA should feel confident that the proposed costs are reasonable and will remain within the cost cap."

Q43 The effort involved in preparing the proposal is significantly higher than in the past. Small organizations are definitely at a disadvantage, since they wouldn't have the engineering resources in-house to address many of the technical questions.

All of the data requested in the Step 1 proposal is considered to be the "current best estimate." These estimates plus reserves and margins (which should be adequate for the accuracy of the estimates) need to add up to a mission that is feasible from a technical, management, and cost perspective. In other words, it is not necessary to identify solutions to all of the requirements --- it is sufficient to propose adequate resources to accommodate those solutions once they are identified in Phase A/B. The Step 1 proposal must present a feasible baseline mission design and identify areas where trade off analyses will be performed during Phase A to arrive at a more optimal baseline. Extra attention should be paid in the proposal to unique requirements.

Please see the document "Report on the 1999 SMEX TMC-lite Solicitation" which is also posted on the SMEX Acquisition Additional Information web page at http://explorer.larc.nasa.gov/explorer/smexacq.html.

Revised December 5, 2002: In areas of mission implementation where the required depth of information is not available, for whatever reason, at this stage of mission design, the proposal must (i) describe the current design concept, (ii) justify that the development of that aspect of the design is not required at this stage and that it is acceptable to develop details later, and (iii) explain why the lack of information at this stage should not translate into a risk to the proposer's ability to implement the mission as proposed. The schedule and process for developing the required depth of information must be explicitly included among the plans for future activity. In the case where a mission is proposed at or near the cost cap, but depth of technical detail is deferred, the proposal must justify the adequacy of the proposed cost reserves given that the proposed cost is not allowed during Phase A to increase beyond the cost cap.

Q44 Without a potential spacecraft vendor on the proposal team, one cannot begin to address the technical questions. It sort of undercuts the notion of being able to submit a proposal even "if teaming agreements are not complete" (4th paragraph of page B-6). It ups the ante for the limited number of potential spacecraft vendors. For a "TMCO-lite" AO, spacecraft vendors were willing to work on several proposals. My guess is that these vendors are going to be a lot more selective this time around due to the work involved, and many potential proposers will not be able to find a spacecraft.

The spacecraft design is not expected to be complete. Therefore, reserves and margins are expected to be adequate for the maturity of the design and the proposed heritage utilization. The proposal team is not required to have a spacecraft partner but they are expected to have identified at least one viable and available spacecraft. To help meet this expectation, NASA offers a catalog of spacecraft buses though its Rapid Spacecraft Development Office (Section 3.4.4).

Q45 The need to provide this amount of data is also inconsistent with the possibility discussed in Section 3.4.4 of having GSFC (or JPL) provide project management, systems engineering, spacecraft, etc in Phase A. The 40 hours allocated for Stage 1 at GSFC is not nearly sufficient to provide the data required to write a good Stage 1 proposal and get to Phase A.

The 40 hours allocated by GSFC for Step 1 are to support the proposing team in the areas listed. It is not intended that 40 hrs are sufficient for GSFC to provide project management. The purpose of this support is to supplement the expertise available to the proposing team in a few key areas not to replace it. The *Available GSFC Services* document in the SMEX Explorer Program Library contains examples of the sorts of support available within the 40 hours. Providing project management requires a teaming arrangement rather than support services.

Q46 There doesn't seem to be a need for all this data. The AO calls out a two-stage process - 4 into Phase A, downselect to 2. If a potential mission has technical, management, or cost problems, it should show up in their Phase A Concept Study Report, and you don't select them.

The purpose of the Step 1 technical, management, and cost evaluation is to eliminate high-risk proposals that have a vanishingly small probability of being implemented within cost and schedule. The intent is for the selection to be made based on science merit and an acceptable level of implementation risk. The data required by the AO in the Stage 1 proposal is needed to accurately identify those high implementation risk proposals.

Please see the document "Report on the 1999 SMEX TMC-lite Solicitation" which is also posted on the SMEX Acquisition Additional Information web page at http://explorer.larc.nasa.gov/explorer/smexacq.html.

Q47 The discussion in Section 3.9.1 regarding the infusion of advanced technology implies that the use of advanced (new) technology is not required ("Investigations dependent on advanced technology will not be penalized….") The evaluation criteria in Section 7.4.4 states that the "Quality of plans for advanced technology infusion and transfer" is a downselection criterion. Is new technology a definite requirement for a proposal, and if not, will the lack of new technology affect the downselection process? Perhaps the wording of 3.9.1 could be changed to specifically state that new technology is or is not a necessary requirement.

Section 3.9.1 states that the infusion and transfer of new technology is a NASA goal; it also states that the Explorer program provides an opportunity to meet this goal. The quality of plans for new technology is not a criterion for Stage 1 selection but is a criterion for downselect (Section 7.4.4). As indicated in the document, *Guidelines and Criteria for the Phase A Concept Study*, in the Explorer Program

Library, the quality of plans for new technology is one of the least important downselect evaluation criteria.

However the use of new technology can induce risk. Section 3.9.1 indicates how that risk can be mitigated without penalty. As stated in Appendix B, Section E, new technology may be penalized for risk if adequate back-up plans are not described to ensure success of the investigation. The implementation risk counts for approximately 25% of the weighting for Stage 1 selection (Section 7.3) and is the most important downselect evaluation criterion (*Guidelines*).

In the sense that the use of technology is an evaluation criterion for downselect, new technology is a requirement. In the sense that missions without new technology have been selected for flight, new technology is not a requirement. Although new technology plans are encouraged by NASA and are evaluated during downselect, the penalty for the introduction of unmitigated risk due to the use of new technology is likely to outweigh the reward for the use of new technology.

Q48 We have noted in recent SMEX and MIDEX evaluations a large number of TMC comments regarding inadequate schedules, particularly the lack of detail to some tasks. Typically, space is tight for sections E, F, and G and PI's are constantly trading schedule detail for space to address other items required in the AO. Since a schedule is required of all proposals, might it not be better to allocate a whole page (add a page, 8.5 X 11, portrait or landscape) that can only be used for a schedule? This would ensure the desired information and provide for better evaluation.

Inadequate schedules were not observed in the majority of proposals reviewed for MIDEX. Therefore, a prescribed solution does not seem necessary. The PI's with that problem can solve it in a number of ways, one of which is the solution proposed.

Q49 We have a question concerning multiple Explorer Mission of Opportunity (MO) proposals to contribute to a foreign mission opportunity. Groups at two U.S. institutions both intend to propose, and we intend to propose distinct technical contributions that have no direct technical interface with each other. Both contributions would be delivered to the foreign instrument integration team.

The best solution we have identified, and on which we seek your input, is to write two MO proposals with the different technical proposals, similar science proposals, two US PIs, each with responsibility for an effort in which they have enough expertise to effectively manage the effort, and clear management interfaces which follow the technical interfaces between each US effort and the foreign project.

This note seeks any general advice you are allowed to provide.

I agree that your proposed solution is consistent with the SMEX AO and the intent of the classic Mission of Opportunity solicitation. So you have (at least) two choices:

- Submit separate proposals that will be evaluated and selected on their own. This gives NASA the option of choosing one or both or neither of the proposed contributions to the foreign mission.
- Submit a single proposal representing the proposed NASA contribution to the foreign mission. This gives NASA the same options (since NASA always reserves the right to partially select a proposal).

In the case of two proposals, I will provide the peer review with instructions to consider each proposal on its own merits. (I always provide this instruction to Explorer peer review panels, but in this case a reminder would be a good idea.)

I will note that, whether you submit one or two proposals, each proposal should clearly state not only the science case for the overall foreign mission, but also the science case for the specific proposed contribution to the overall foreign mission.

Q50 I have an idea for a SMEX that attaches to the ISS. It can be divided into two parts. If I attach one part to a nadir-pointing full truss site, and the other part to a zenith-pointing full truss site, then there are lots of scientific and logistical advantages. Is it allowed to propose to use both truss sites simultaneously?

No. The OSS allocation on the ISS does not include two truss sites. A proposal for OSS to provide two truss sites for a SMEX investigation would not be compliant with the SMEX AO. If another ISS stakeholder, who has an appropriate ISS allocation, contributed the second truss site to the investigation, then such a proposal might be compliant.

Q51 In the SMEX draft AO, the page limit for the section on mission implementation, management, schedule, and cost and cost estimating methodology is limited to 20 pages. We think that it will be extremely difficult to include everything that is asked for in 20 pages at the level that is required for evaluation by TMC. Will we be restricted to 20 pages for that section?

Many proposers are able to include in 20 pages everything that is required for a Stage 1 proposal. We have no plans to change the page limit allocations, though you should carefully read the AO when it is released.

Q52 For SDB participation: does all work count toward the quota, or do only first tier subcontracts count? What about second tier contracts?

Only first tier subcontracting counts. The exact wording from the General Instructions for Standard Form 294 (http://sbo.od.nih.gov/sf294.pdf) is:

7. Subcontract award data reported on this form by prime contractors/subcontractors shall be limited to awards made to their immediate subcontractors. Credit cannot be taken for awards made to lower tier subcontractors.

Q53 Is it allowable to propose a SMEX on the ISS that places attached payloads on both a full-truss site and the JEM-EF? Is there a limit to the number of attach sites useable under such a scenario? What is it?

The Office of Space Science has a limited allocation on the ISS. During the time period solicited for this AO, the OSS allocation is sufficient for a full-truss site, or a combination of smaller sites, but not both.

The OSS allocation on the ISS is not sufficient for both a full-truss site and a JEM-EF site. A proposal for OSS to provide both a full-truss site and a JEM-EF site for a SMEX investigation would not be compliant with the SMEX AO. If another ISS stakeholder, who has an appropriate ISS allocation, contributed a second ISS attach site to the investigation, then such a proposal might be compliant.

Q54 If we propose to use a Japanese attach site, would it count as a contribution? Are there subtleties in proposing such an instrument that we might not have thought of?

If NASDA, the agency providing the JEM-EF, were to provide an attach point for a proposed investigation out of their ISS allocation, then that would count as a contribution. There are no costs attached to the actual site allocation. Any contribution that NASDA contributes towards building and flying the payload would count as a contribution. NASDA would also have to provide the launch and on-orbit resources since those would be outside of OSS's allocations.

Q55 Is there any time limit for Phase B (i.e., the time between the Phase A Study Report and the Confirmation Review at the end of Phase B)?

There is no time limit for Phase B. The constraints that limit Phase B include (i) the launch date requirement (no later than August 2008) and (ii) the pre-Confirmation spending limit (Section 4.5: *The nominal limit for all studies prior to the Phase B/C Confirmation and the initiation of mission detailed design (Phase C) is 25% of the total NASA OSS commitment for Phases A/B/C/D.).*

Q56 Is the technical review prior to Phase C/D considered the CDR or is this a separate NASA review in addition to the normal CDR?

The Confirmation Review is a NASA programmatic review that is separate from the normal CDR.

Q57 On page 37 of the Draft SMEX AO it states that at confirmation we must demonstrate "20% cost reserve against the cost to complete". (i) Is the meaning of "cost to complete" the cost from Confirmation through launch plus 30 days? (ii) In the case of a Shuttle launch for an ISS attached payload, does the cost to complete exclude the launch costs?

The Draft SMEX AO has been modified to place an increased emphasis on adequate cost reserves to mitigate cost risk (see "Modifications to the Draft SMEX AO" on the SMEX Acquisition Additional Information Page at http://explorer.larc.nasa.gov/explorer/smexacq.html.) (i) The Draft AO says: "*A cost reserve of less than 20% against the cost to complete (not including the launch vehicle or MO&DA) will require extraordinary justification."* Here, the phrase "cost to complete" means the cost from Confirmation through the end of the baseline mission excluding the launch vehicle and MO&DA costs. Note that the lack of a 20% minimum cost reserve on MO&DA does not automatically mean that there is no need for cost reserves on MO&DA. The cost reserve posture for MO&DA, whether it is zero or some larger amount, should be justified. (ii) In the case of a Shuttle launch for an ISS attached payload, there are three components to the costs associated with the Shuttle: transportation costs, standard services costs, and special services (mission unique) costs. It is not necessary to carry cost reserves for transportation and standard services costs. It is necessary to carry reserves for special services (mission unique) costs.

Q58 In Table B-3 (page B-16) one of the cost line items in phase C/D is "Launch + 30 days Ops". We think that this is our cost for the 30 day period between launch and L+30days. Is that correct?

Yes. This is the cost for mission operations during the period between launch and the end of in-orbit-checkout (typically L+30 days for a satellite) which is the end of Phase C/D.

Q59: The draft SMEX AO indicates that the only NASA centers that can provide project management are JPL and GSFC. If we propose an ISS attached SMEX, can JSC (Johnson Space Center) provide the project management?

Yes. JPL and GSFC are the only NASA centers that may provide project management for free-flyer SMEX missions. For ISS attached SMEX missions, JSC is also allowed to provide project management. The final AO will indicate this.